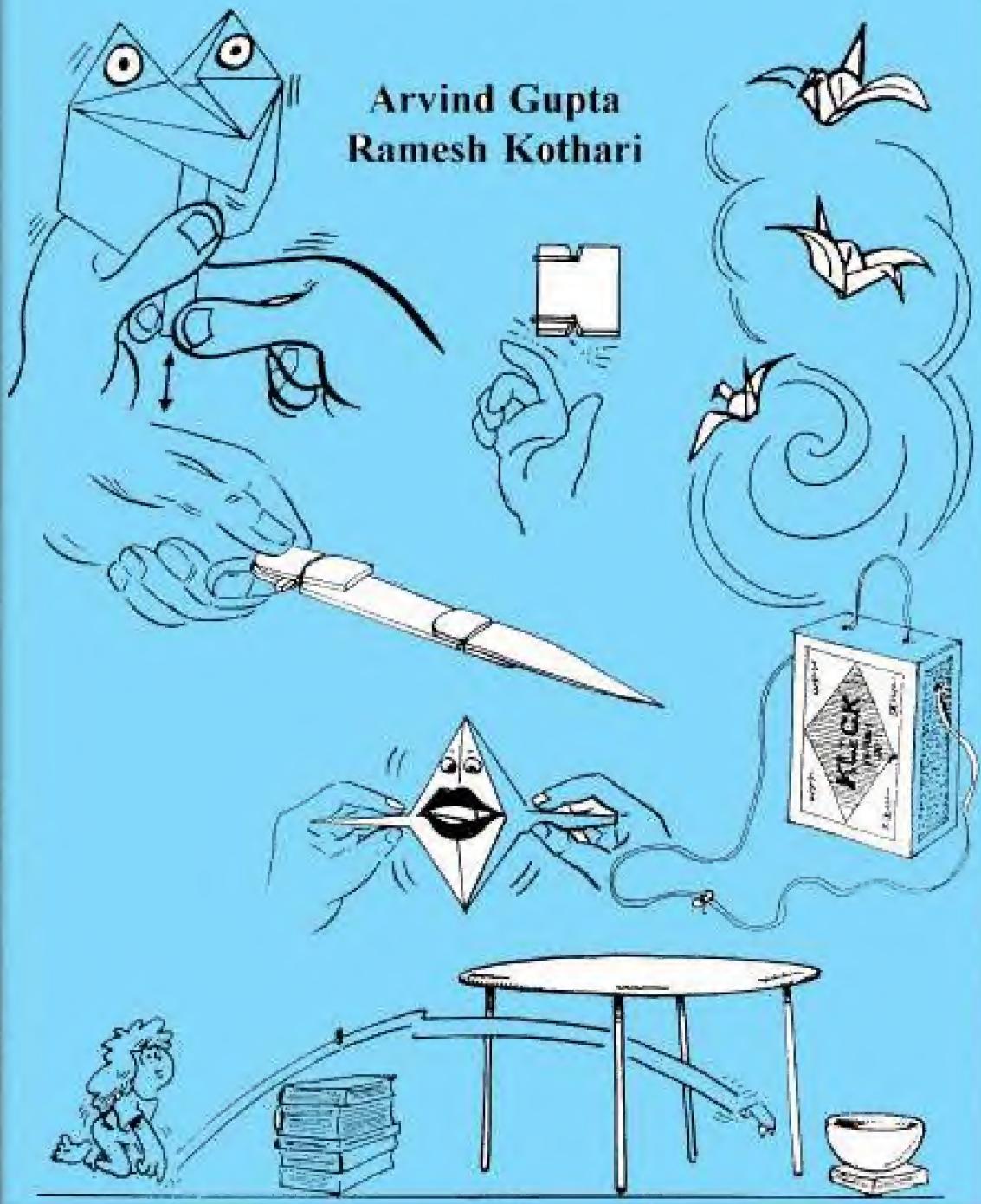


TOY JOY

Arvind Gupta
Ramesh Kothari



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**Arvind Gupta
Ramesh Kothari**

**Illustrations
Avinash Deshpande**

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Foreword

The best way to understand and learn the basic principles, and the method of science is to see them in actual practical use, or to put them to use yourself.

The same basic scientific principle can be put to use under different circumstances and in response to different needs and objectives. On this very basis, new and innovative toys and different types of instruments, tools and machines keep getting invented. It is in this connection that necessity has also been said to be the mother of invention.

One more thing. Children, from the very beginning, should be encouraged and persuaded to make use of their heads and hands. Read this book and try making the toys on your own. Going through this book, if you don't understand something, think it over, apply your own mind and try doing something on your own and by yourself. If what you make does not quite look like the toy shown in the book, but works, the same way or even differently, this is even better !

Our very objective is to promote in children confidence in their own thinking and understanding and in themselves.

Narendra K. Sehgal

Director

New Delhi
February 28, 1991.

National Council for Science &
Technology Communication
New Delhi 110016.

Toy - Joy

The best thing a child can do with a toy is to break it - rip it open, see its innards, only then will she be able to appreciate its beauty and working. The next best thing, however, is to make the toy herself. It will give her the thrill and joy of making a toy ' come to life '.

Children have always made toys. Prior to the onset of mass - manufactured ' packaged ' toys, generations of children made their own toys. This book shows you a few toys which you can make in just a few minutes. Children are always interested in toys which jump, hop, flap, fly , roll, or make a sound. All the toys chosen in this book ' do ' something - they have a simple dynamic element embodied in them. This is what makes them so appealing. Most of these toys can be made and given away as gifts to friends.

Some of these toys have a very long history. For instance, the Flapping Bird has been made by children in Japan for over 300 years ! It is amazing to see a square, cut from an old newspaper, transform into a most elegant and dynamic bird, with just a few simple folds. When children fold a bird, or a frog, they are making a lot of realistic lines, angles and polygons. Without being burdened with the mumbo - jumbo of mathematics they are subconsciously, perhaps, learning a great deal of practical geometry ! As the end result, is a lively paper model, which either flaps or jumps, so it makes the children happy, and they want to do more of it.

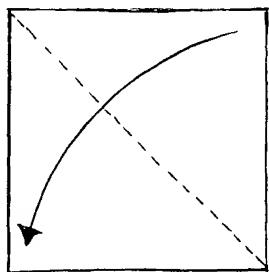
Old newspapers cut into squares, would do well for most of the paper models. For some others, you might require the cover page of an old magazine. The other toys use materials like old matchboxes, soda water bottle crown caps, sketch pen caps etc. which are abundantly available. By using such materials, apart from making a joyous toy, one also helps in cleaning up a bit of rubbish produced by this consumerist society.

Detailed, step - by - step instructions have been given to make each toy. But do not be afraid to try out your own ideas and variations. Who knows, you might be able to create something very unique and splendid. So, keep experimenting.

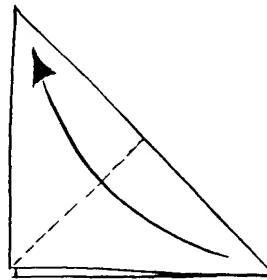
Wishing you happy toy making.

Rabbit

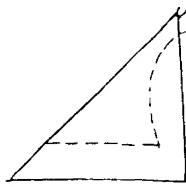
This half a minute toy is sure to steal your heart. As you move the rabbit's tail back and forth, it starts flapping its ears up and down!



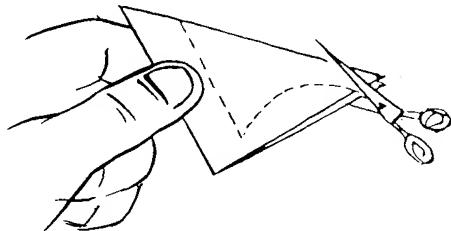
1. Take a paper square with an edge length of 10 cm. Fold along one diagonal to make a big triangle.



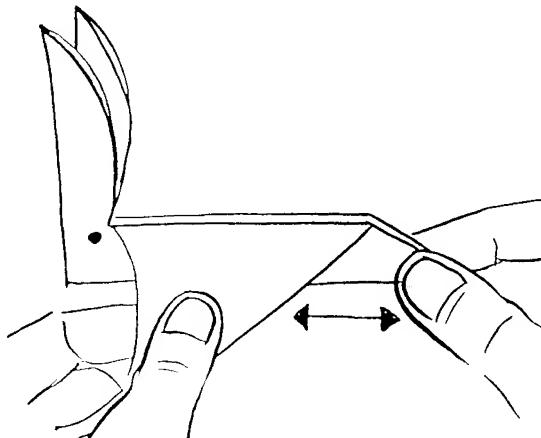
2. Fold the big triangle into half to make a small triangle.



3. This small triangle will have a 'V' shape. Draw the ears of the rabbit with a curved dotted line.



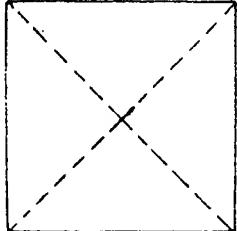
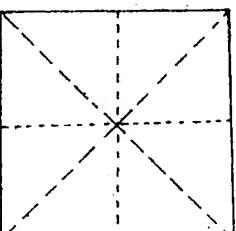
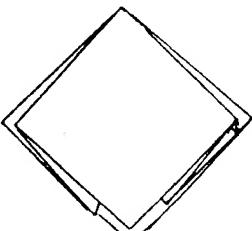
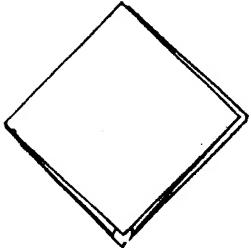
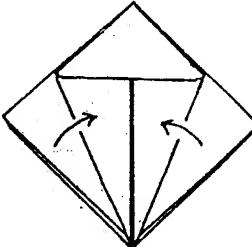
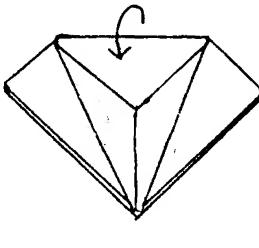
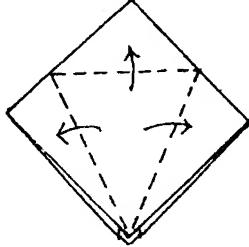
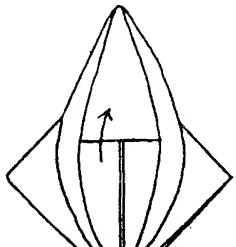
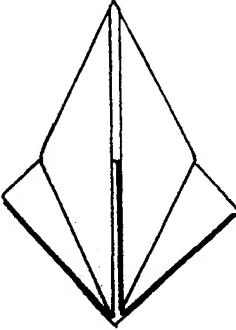
4. Cut only along the curved portion (not on the straight portion) of the dotted line to make the ears of the rabbit.

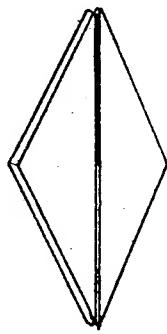


5. Fold along the straight dotted line to make the front legs of the rabbit. Now hold the rabbit with the left hand as shown and move the tail back and forth with the right hand. The rabbit will flap its ears.

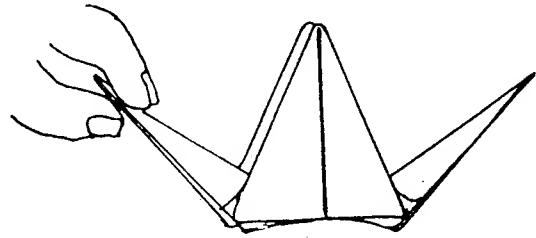
Flapping Bird

Children in Japan have been making this bird for the past 300 years. You do not even need a scissors or glue to make it. You just need a paper square and your fingers.

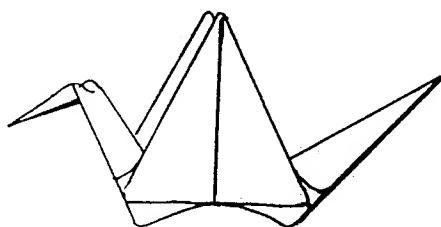
		
<p>1. Start with a 10 cm paper square. Fold a criss - cross. Then turn over. You will find a hillock.</p>	<p>2. Fold a plus sign in the opposite direction.</p>	<p>3. Now fold the paper into a quarter making a shape of a bud in the process.</p>
		
<p>4. Crease well, so that the edges sit on one another.</p>	<p>5. Fold the left and right flaps of the top layer to the vertical centerline.</p>	<p>6. Fold the top triangle to make a cobra head.</p>
		
<p>7. Lift the top layer to the base of the top triangle...</p>	<p>8. and carefully fold a diamond.</p>	<p>9. Sharp crease the folds of the diamond.</p>



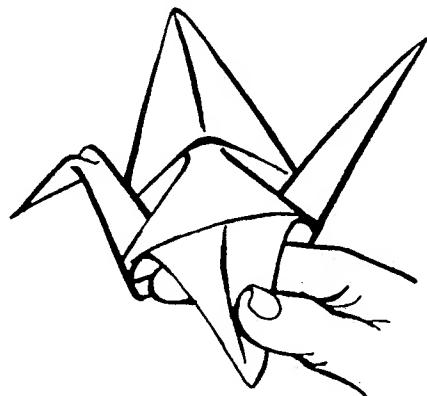
10. Similarly, make another diamond on the reverse. This is the bird base.



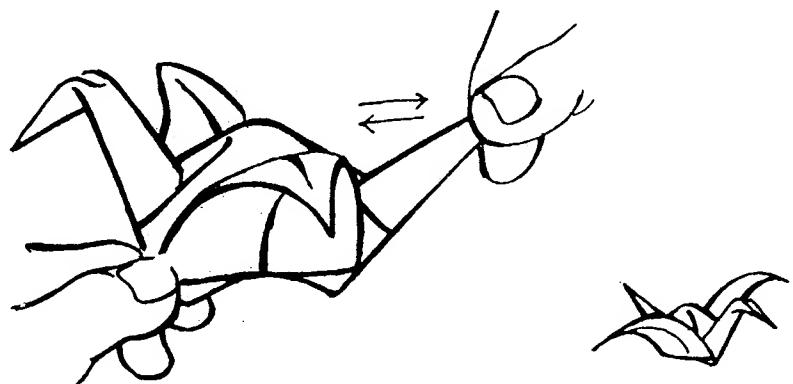
11. Lift the cut portions between the two wings.



12. Fold a beak on the neck.



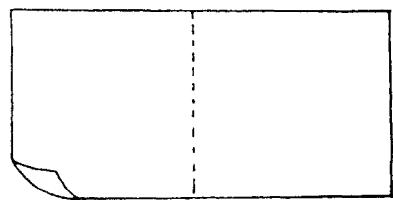
13. Gently curve the wings downwards. Do not crease them sharply.



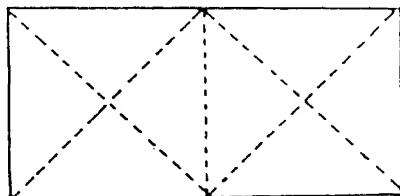
14. Now hold the bottom of the bird's neck with one hand and pull its tail repeatedly with the other. The bird will magically flap its wings.

Jumping Frog

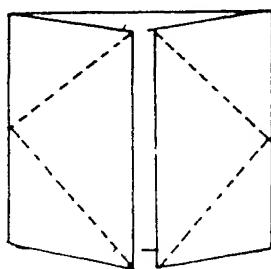
This is an amazing paper toy. It needs a special size of rectangular paper where the length is double the width. The frog has a special spring folded from the paper itself. When you press the spring it makes the frog leap and jump.



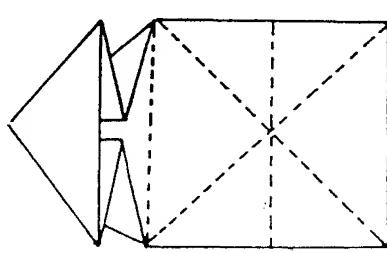
1. Take a 10 cms. x 20 cms. rectangular sheet of paper. Fold two squares in it.



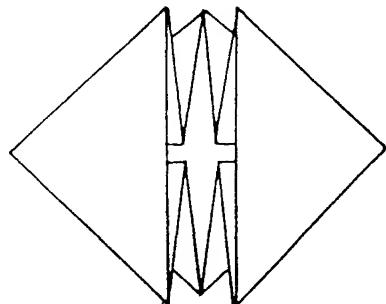
2. Fold criss-cross diagonals in both the squares. All the four creases should be in the same direction.



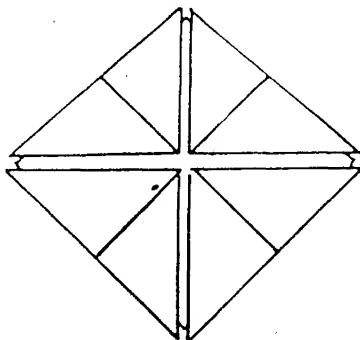
3. Reverse the paper. It will look like two hillocks. Fold the edges of the hills to the midline.



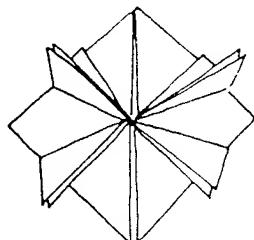
4. Reverse the paper. Tap the centres of both squares to get two cups. Push to make a triangle.



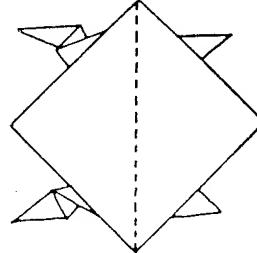
5. Repeat the same for the right side.



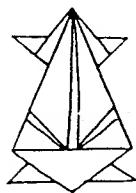
6. Bring all the four standing triangular ears to the left and right hand side corners and crease.



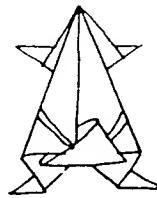
7. Bisect the internal angles to make the legs jut out.



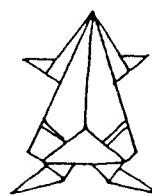
8. The model when reversed looks like a tortoise. Crease its backbone.



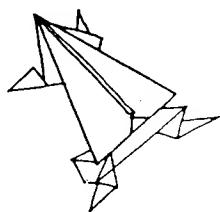
9. Crease the left and right hand edges of the diamond shape to the backbone.



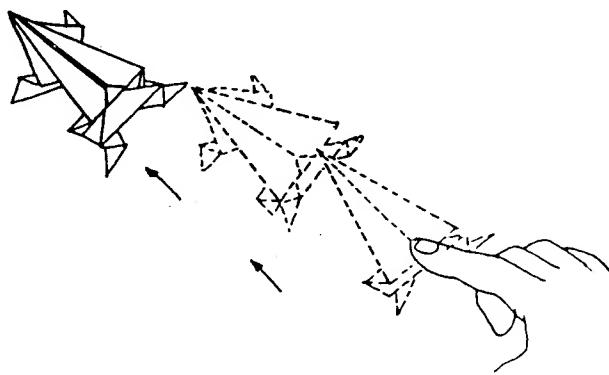
10. Fold the base triangle upwards, and insert the left flap in the pocket of the triangle to make a lock.



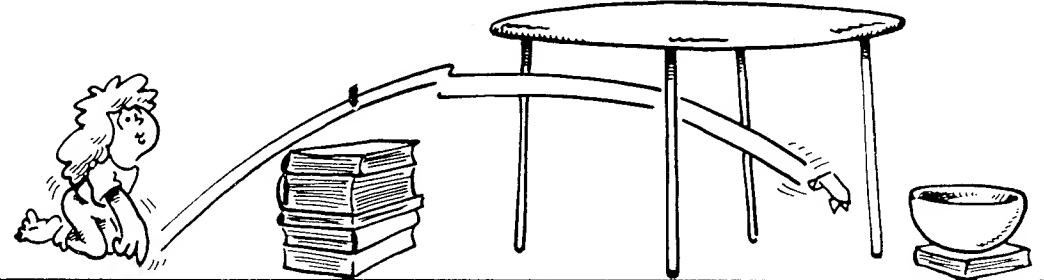
11. Similarly, lock the right flap.



12. Make a Z shaped spring by first folding the frog backwards and then forwards.



13. Press the spring to make the frog jump and leap.

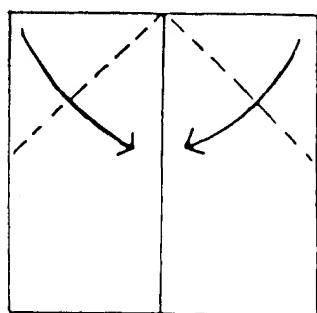


14. You can also make the jumping frog jump over a mountain of books into a well. You can have great fun with your friends, taking turns in the game of making the frog jump into the well. Everytime you are able to get the frog into the well you score one point. See who can score more points.

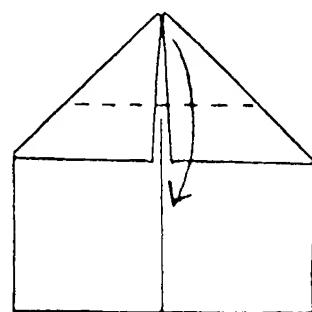
You can make big frogs and small frogs but everytime you must start with a paper whose length is double its width. The best paper to use is an old xerox paper sheet or else the thin cover of an old magazine.

Rolling Toy

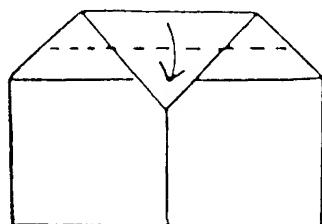
You will thoroughly enjoy making this two minute tumbling toy with a piece of paper.



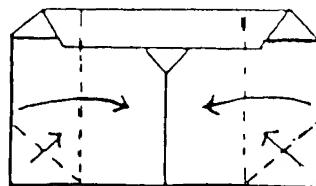
1. Take a slightly stiff square paper with an edge length of 10 cm. Fold its two adjacent corners to the centreline.



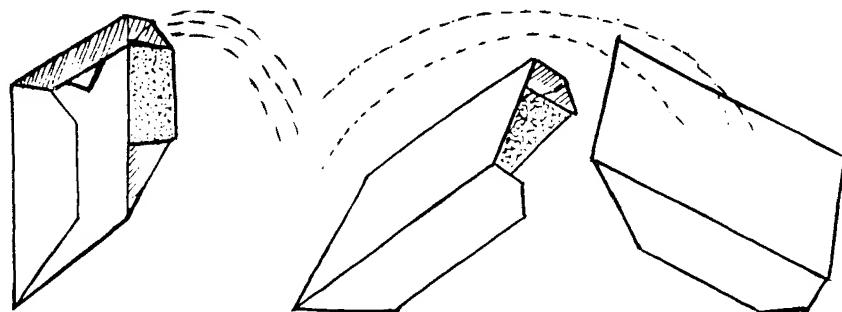
2. Fold the top point and bring it slightly below the centre.



3. Crease the folded part along its centreline.



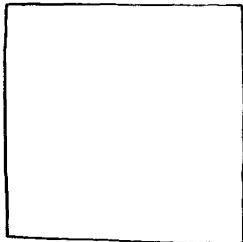
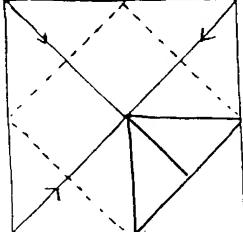
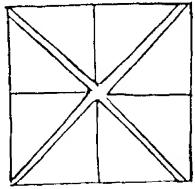
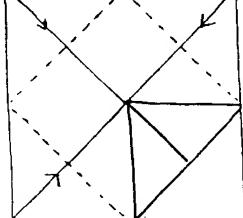
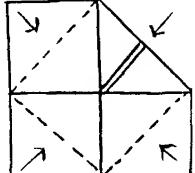
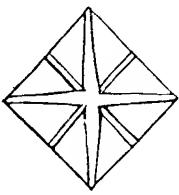
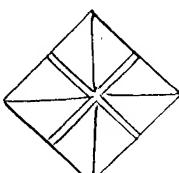
4. First fold the sides to the vertical midline - unfold and then fold the corners to the crease.



5. Leave the toy with the ramp end down on the table and see it tumble. Why does it roll over ? There are eight layers at the top edge, which makes it heavy. So, when it falls there is enough momentum to roll over once.

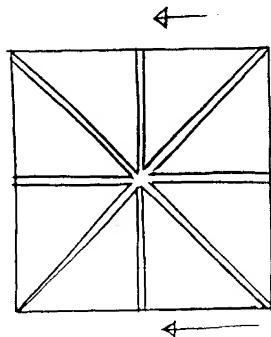
Tippy - Tippy - Tappy

The next two puppets are made by first folding a tippy - tippy - tappy (or the *Din -Raat*), with which many children are familiar. Small changes are made in it to make these interesting puppets.

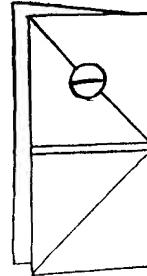
	
<p>1. Take a square piece of paper with an edge length of 16 cm.</p> 	<p>2. Fold the diagonals to locate the centre.</p> 
<p>3. Bring all the four points to meet at the centre and crease to make an envelope.</p> 	<p>4. Turn the folded paper over and once again fold each of these new points to the centre.</p> 
<p>5. Turn the paper over.</p> 	<p>6. This is the double - diagonal base - or the tippy - tippy - tappy. We will use this for making the next two puppets.</p> 

Cat Chat

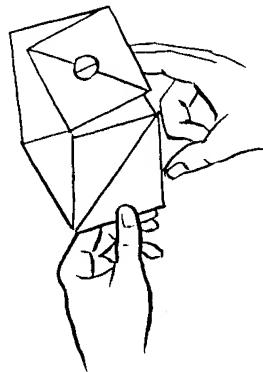
This is an animated puppet. You can make the cat open and close its mouth. You can also ask a little child to put her finger into the cat's mouth and then grab it !



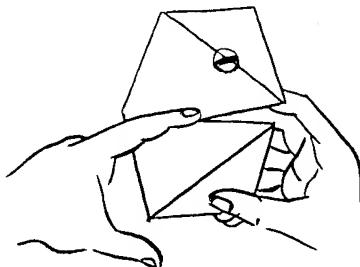
1. Turn the double - diagonal base over. Bring the top edge down to meet the bottom edge. Crease sharply and open. Fold the right edge to meet the left edge. This time do not open.



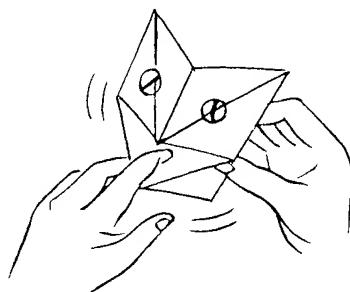
2. Lift the folded paper in your left hand. You will find four flaps along the right edge.



3. Slip your right pointer and middle fingers into the two upper pockets.



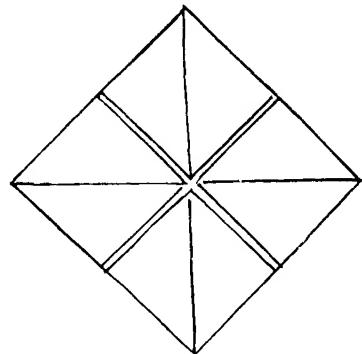
4. Grasp the lower right hand corner between your right thumb and ring finger. Insert your left pointer finger into the cat's mouth.



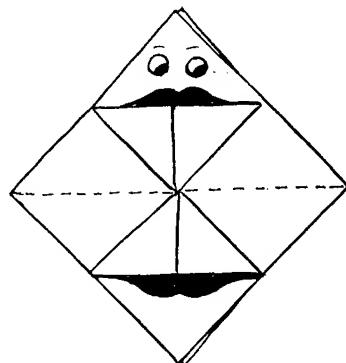
5. Close the fingers of your right hand around the left pointer finger. Remove the left pointer finger . By raising and lowering your right hand fingers, you can make your cat chat !

Chatter Box

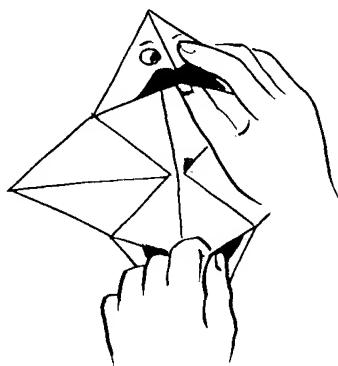
A few very simple folds and a new face will transform the Cat Chat into this amazing puppet. By moving your hands you can make the Chatterbox chatter !



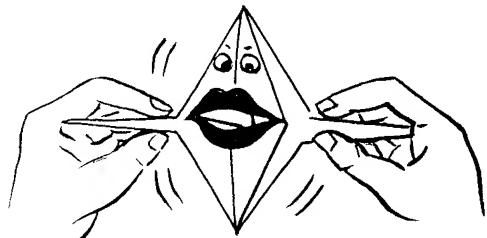
1. Take the double - diamond base of the Cat Chat and fold its two opposite flaps in the middle. These two triangles are the upper and lower halves of the chatterbox's face.



2. Crease along the middle line and draw the face.



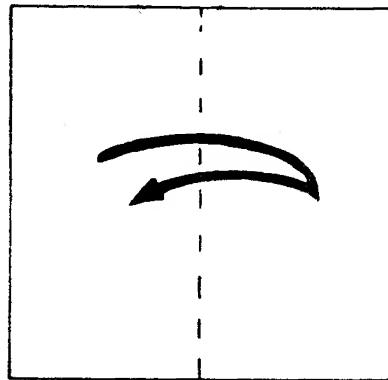
3. Slip your thumb under the upper half of the face and pinch the centre crease, so that the nose stands out. Pinch the bottom centre crease too.



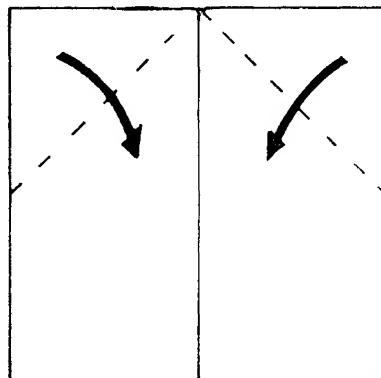
4. Hold the side corners with the thumb and pointer fingers of both your hands so that the two halves of the face are brought together. By pushing your hands closer and taking them apart you can make the Chatterbox chatter away to glory.

Talking Frog

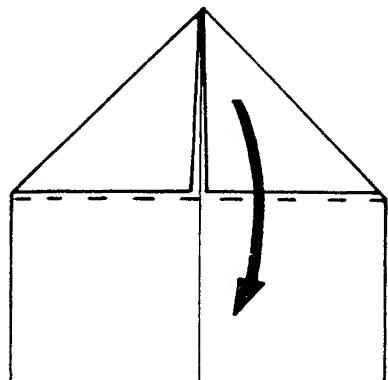
As you move a little strip up and down, the lower jaw of this frog moves up and down too. It appears as if the frog is talking!



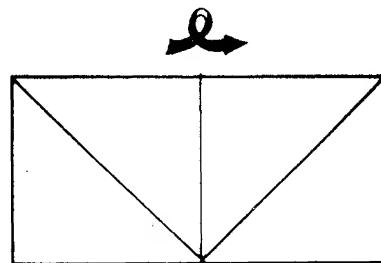
1. Start with a 10 cm paper square. Fold the left edge over to the right edge and unfold.



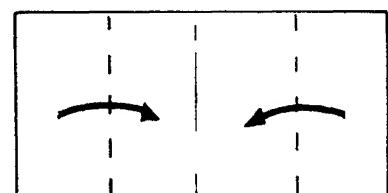
2. Fold the top corners on to the vertical crease.



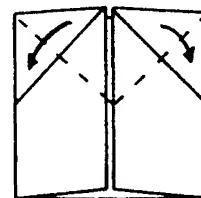
3. Fold down the top triangle.



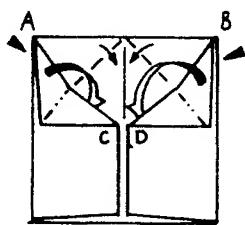
4. Turn over.



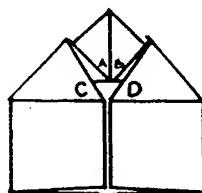
5. Fold the sides in to the middle.



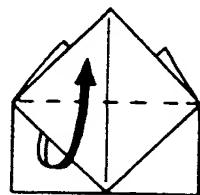
6. Fold the top inside corner of each flap to the outside edge.



7. Reverse fold A and B in to the centre crease to lie behind C and D.



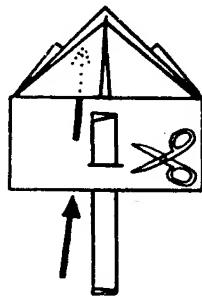
8. Turn over.



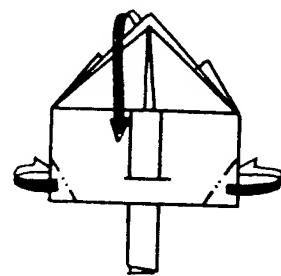
9. Fold the bottom corner of the diamond up to the top.



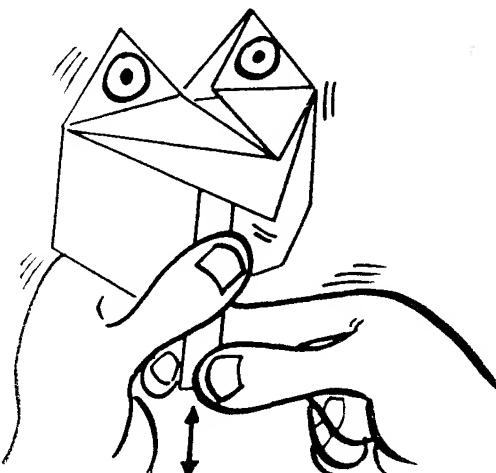
10. Fold over and over a strip of paper, which is a little longer than the height of the model.



11. Make a small tear across the middle of the model near the bottom edge. Put the strip through the tear and push it up under the top triangle as far as it will go.



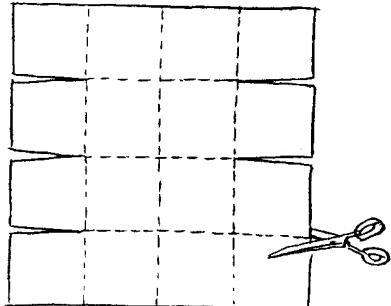
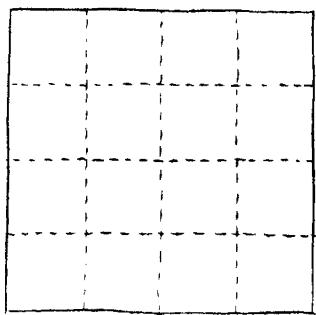
12. Fold the bottom corners behind. Fold down the front and back triangles at the top to make the mouth come forward.



13. The Talking Frog is now complete. Draw in the eyes. Hold as shown and move your right hand up and down. The frog will talk.

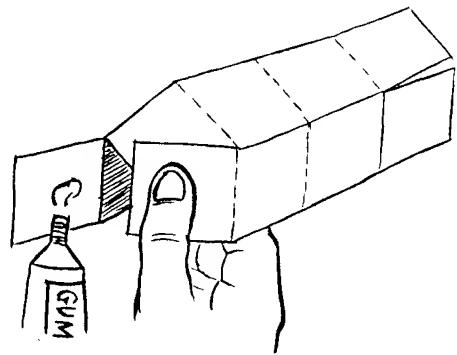
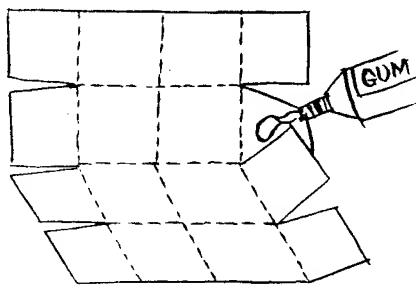
Paper House

Fold a square piece of stiff paper and then cut and glue to make this beautiful house.



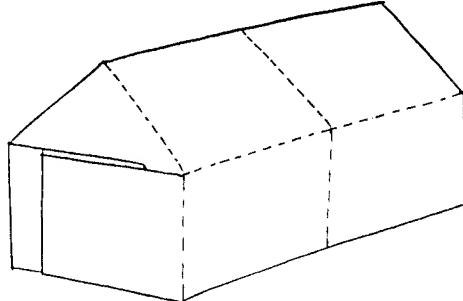
1. Take a stiff square paper with an edge length of about 20 cm. Fold 16 small squares in it.

2. Cut along the six quarter lines as shown.



3. Put one middle square exactly on top of the other and stick them with glue. They will make the triangular roof of the house.

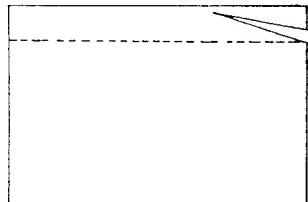
4. Stick the two end squares to make the side wall of the house. Do the same on the other side to complete the house.



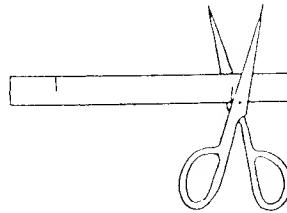
5. Using different sizes of squares you can make houses of different sizes. You can cut doors and windows and make them more realistic. The outline of the house can be drawn on a big cardboard. Children can then make the rooms, furniture, kitchen etc. on the cardboard and then cover it with the paper house.

Flying Fish

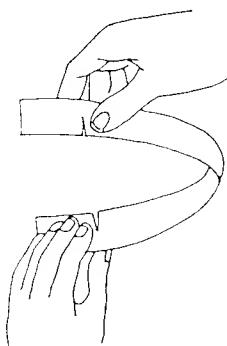
This is perhaps the most amazing flying object. Its simplicity is mind boggling. Just from a strip of an old newspaper you can make the Flying Fish in less than a minute!



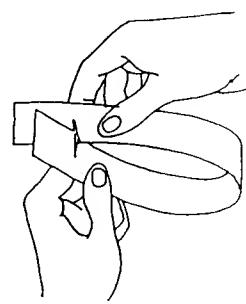
1. Take an old newspaper. Cut a strip 2 cm wide and about 12 cm long.



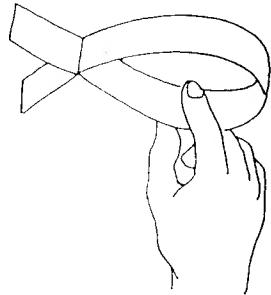
2. On the lower right hand side, cut the slit half way across the strip, about 1.5 cm from the end. Make a similar cut on the top left end of the strip.



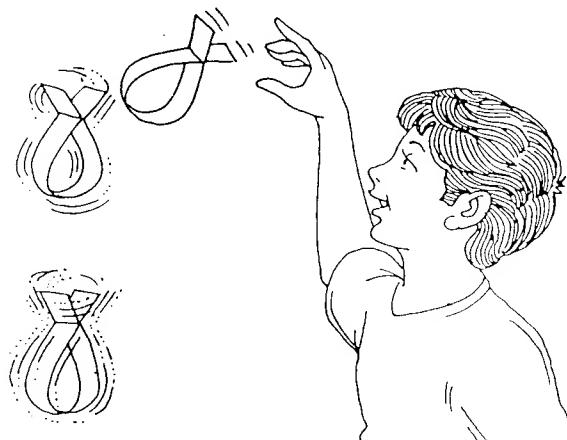
3. Bring both the cut portions together.



4. Slip both the slits into each other so that they are interlocked.



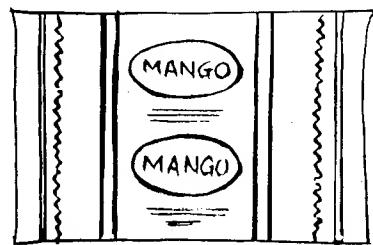
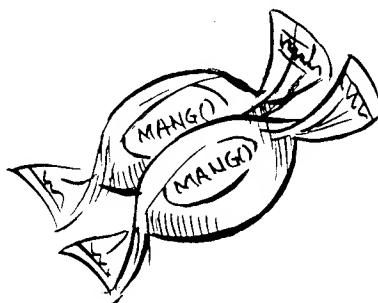
5. The fish is now complete.



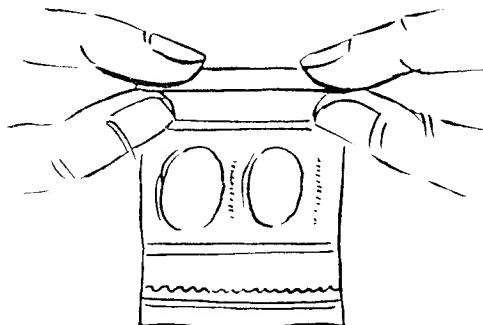
6. Throw it high in the air and it will twist and turn around on its way to the ground. Try making Flying Fishes of various sizes and colours.

Toffee Wrapper Whistle

You just need a toffee wrapper to make this shrill whistle. This whistle is a children's delight, but a teacher's nightmare!



1. Toffee wrappers are not for throwing, for you can make a lovely whistle out of them.



2. Hold the short edge of a toffee wrapper tightly between the thumb and first finger of both the hands.

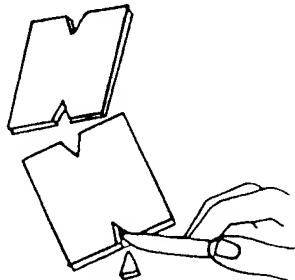


3. Place the edge close to the mouth and blow hard. The edge will vibrate and give out a shrill whistle like sound.

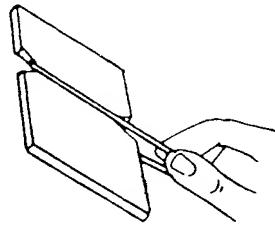
Don't give up if it doesn't work the first time. Try a few times and soon you will get a knack of it.

Clap in the air

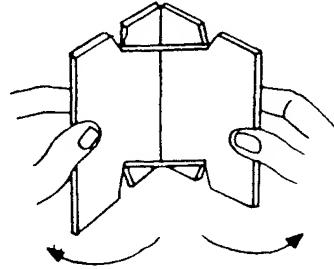
As you open out and reverse fold the two cardboard pieces, the rubber band is stretched and energy is stored in this toy. On throwing it up in the air, the cardboard pieces strike each other and produce a loud clap.



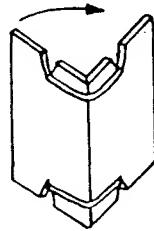
1. Take two stiff cardboard squares with an edge length of 6 cm. Make 'V' cuts as shown.



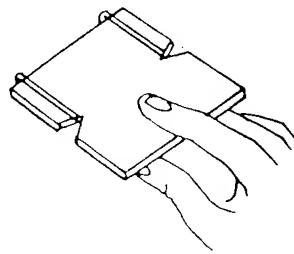
2. Place a rubber band in the 'V' notches. The rubber band joins both the cardboard pieces.



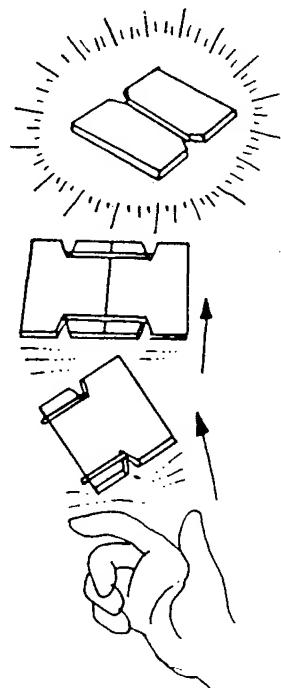
3. Now open the cardboard pieces and fold them in the reverse direction.



4. This stretches the rubber band. The rubber band is in tension.



5. Now throw these refolded cardboard pieces in the air.

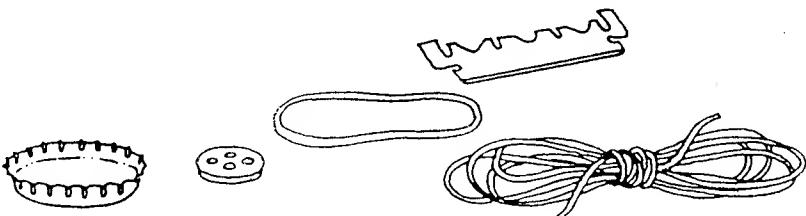


6. You will hear a loud clap in the air. If you place the reverse - folded cardboard pieces on top of the table then the toy will jump spontaneously.

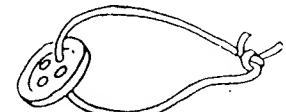
Tik - Tiki

As you run your fingers along the knotted string of this simple musical toy, it makes a series of tik - tik - tik sounds.

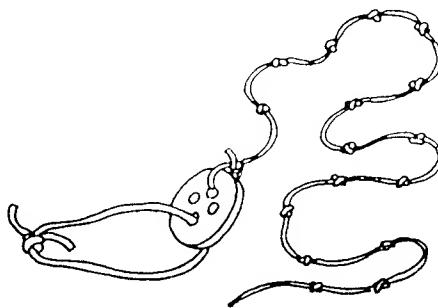
1. To make the tik - tiki, you will require a soda water, crown - cap, a shirt button, a rubber band, blade and 50 cm of thick string.



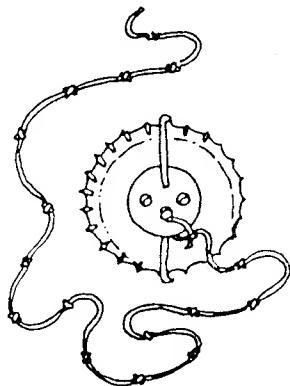
2. Cut a small rubber band. Weave it through the hole in a shirt button and tie its ends into a knot.



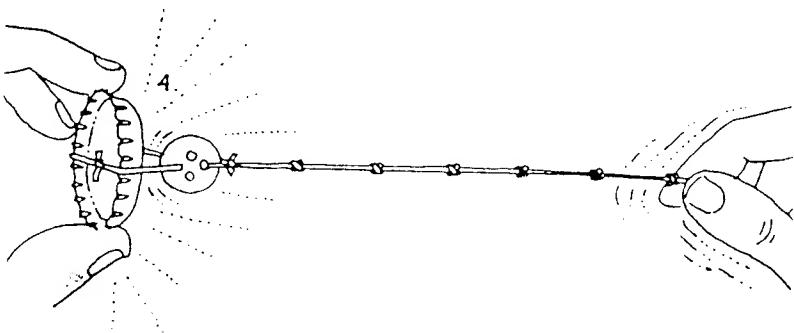
3. Take 50 cm of string (not sewing thread) and tie a series of knots on it at approximate intervals of 2-3 cm. Tie one end of the knotted string to the button hole opposite the rubber band.



4. Stretch the rubber band and slip it over the soda water bottle cap.

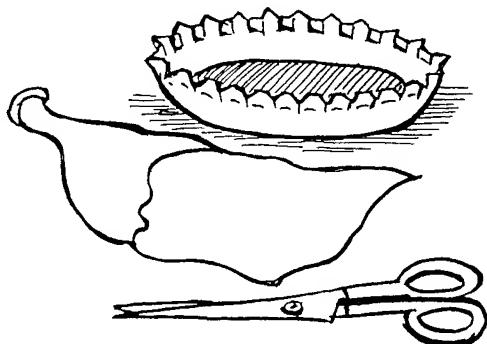


5. Now hold the cap in the left hand and run the thumb and index finger of the right hand along the knotted string. The button will make a series of taps on the cap and produce a melodious ditty.

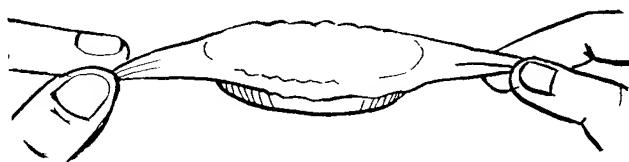


Soda Cap Organ

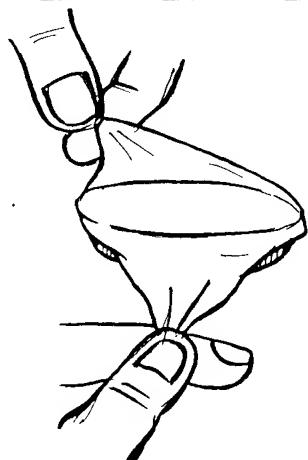
With a soda water bottle crown cap and a torn balloon, you can easily make a musical organ. When you blow on the organ, it makes very sweet and musical notes.



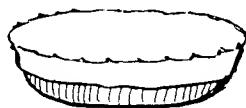
1. Take a soda water bottle crown cap. Also take a torn balloon. If you do not have one, then cut open a new balloon.



2. Stretch a single layer of the balloon rubber on the cap.



3. Stretch the balloon tightly over the mouth of the cap. The serrations on the rim of the crown cap will hold the balloon in place.



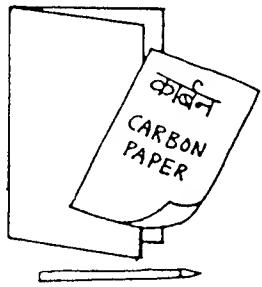
4. The stretched balloon acts like a membrane in tension.

5. Now keep the cap close to your lips and blow at an angle. You will be able to hear loud and musical notes from this organ. With a little practice you will find out the correct angle of blowing the air.

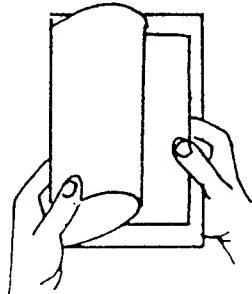


Dancing Eyes

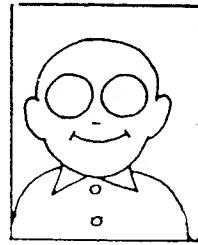
Even when an object is removed from in front of our eyes, we still keep seeing it for a fraction of a second. This is the principal of persistence of vision. It is because of this optical illusion that we are able to see a film in a cinema hall. There are individual frames in the film reel. But these frames come so quickly before our eyes that we see a continuum.



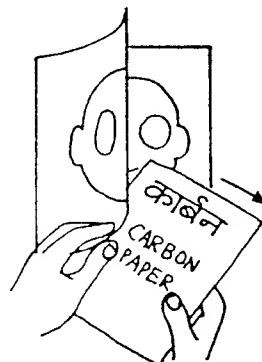
1. Fold a piece of paper in half and place a carbon paper in between.



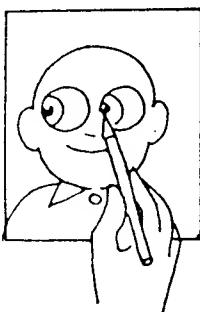
2. Draw the outline of a face but do not make the eyeballs.



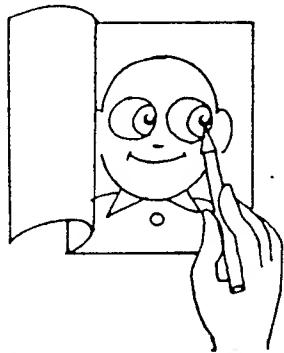
3. The face is ready.



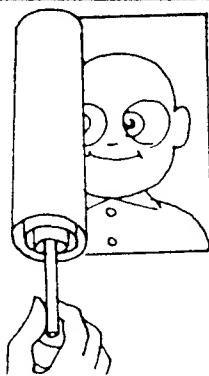
4. Now remove the carbon paper.



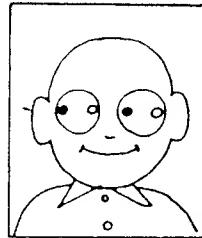
5. Draw the eyeballs to the left of the eyes on the top sheet.



6. Make the eyeballs to the right on the bottom sheet.



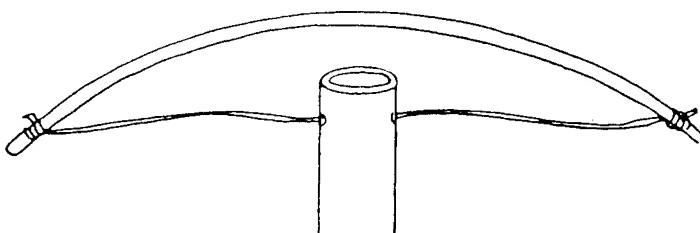
7. Now quickly move the top paper back and forth on the bottom sheet.



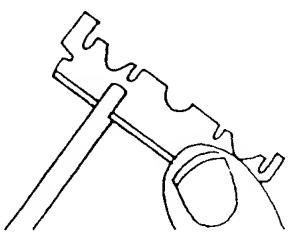
8. You will see the eyeballs dancing from the left to the right.

Bird in the cage

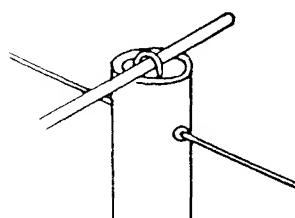
We continue to see a thing for a little while longer even after it has been removed from our sight. This is called persistence of vision. This can be shown through this simple toy.



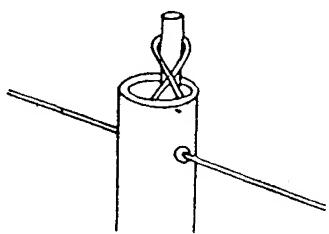
1. Make a hole through an old cardboard thread reel. Weave a thread through this hole. Tie the two ends of the thread to the two ends of a strong coconut broom stick bent into an arc like a bow.



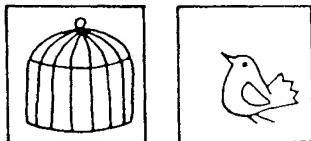
2. Take a 10 cm long reed from a *phooljhadu* (broomstick) and split it for 1 cm from one end.



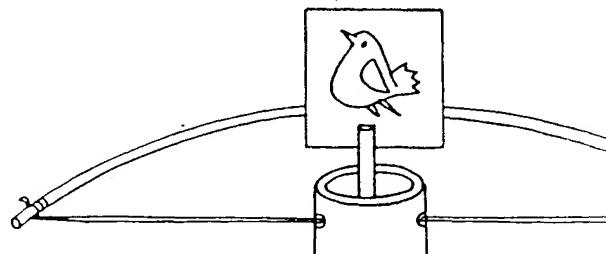
3. Insert the other end of the reed inside the reel and remove the thread.



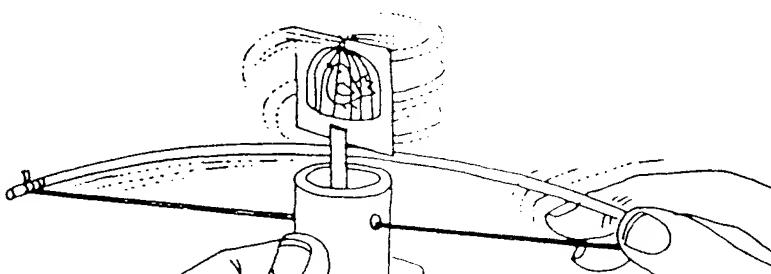
4. Rotate the reed by 180 degrees and insert it inside the reel so that the thread loops once around the reed.



5. Make a bird and a cage on either side of a 3 cm square card sheet.



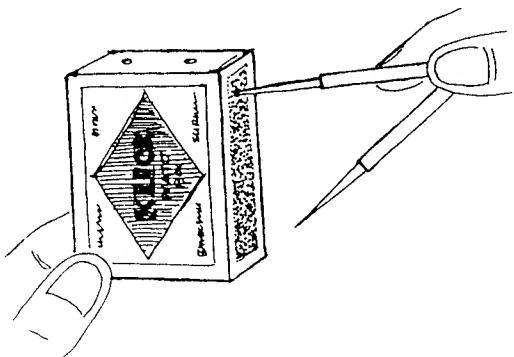
6. Wedge the card in the slit on top of the reed and apply some glue to stick it.



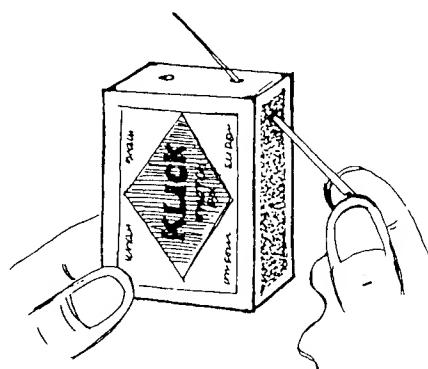
7. Hold the thread reel with the left hand and move the bow to and fro with the right hand. The reed will turn round and round and the bird will appear to be encaged. The bow drill is a beautiful mechanism. It converts the straight line motion of the bow, into the rotary motion of the reed.

Matchbox Racehorse

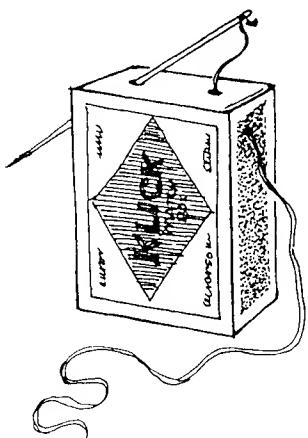
This zero cost dynamic toy is made by threading an old cardboard matchbox in an ingenious way. As you move one hand the matchbox travels from one end to the other.



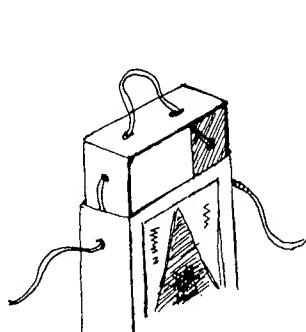
1. Make a hole each on the strike surface of a cardboard matchbox, about 1.5 cm from one end. Make two more holes on the drawer using a divider point.



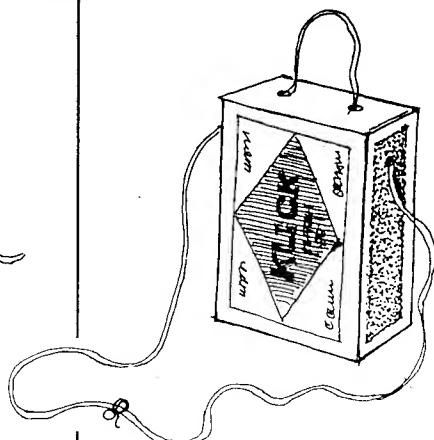
2. Take a needle with a 1.5 metre long string. Thread the needle through the strike surface and the drawer hole.



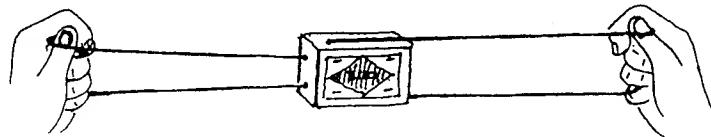
3. Thread the needle through the other two holes too.



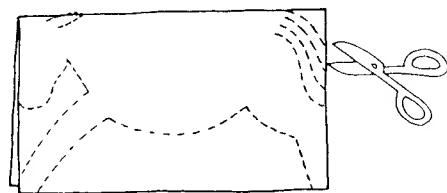
4. The threaded matchbox will look like this.



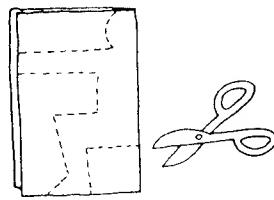
5. Now, tie the two ends of the thread to complete the mechanism.



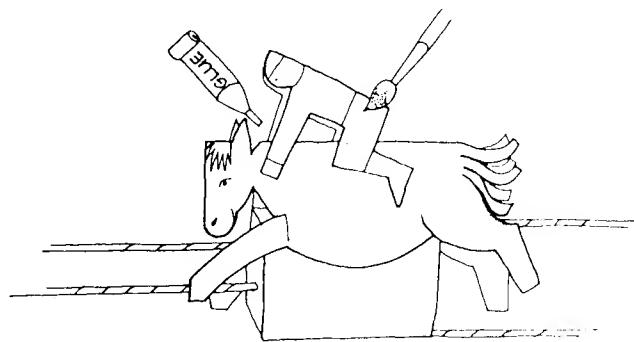
6. Hold the string in both hands as shown. Turn and twist the left hand rapidly. The matchbox will travel along the string tracks.



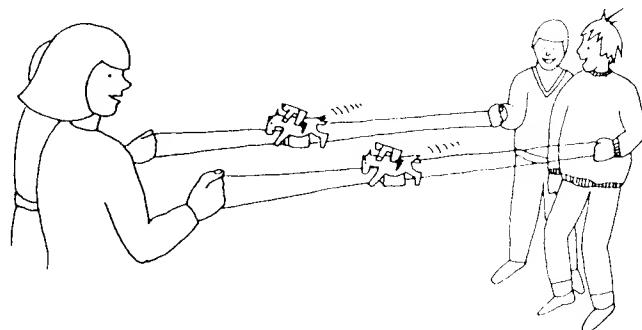
7. Take a 10 x 12 cm sheet of paper and fold the short edges together. With the folded edges at the top draw the shape of a horse and cut it out.



8. Take a 6 x 8 cm sheet of paper and fold the short edges together. With the folded edges at the right, draw the shape of a seated rider and cut its shape.

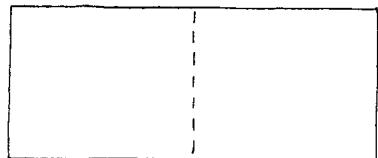


9. Decorate the horse and rider. Glue both of them on the matchbox mechanism. Ensure that there is plenty of room for the string to run freely.

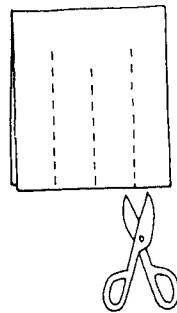


10. You can make the track as long as you like by making the string longer or shorter. And with two other friends you can hold your very own horse race.

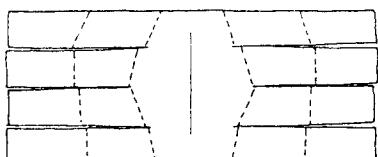
Rider Spider



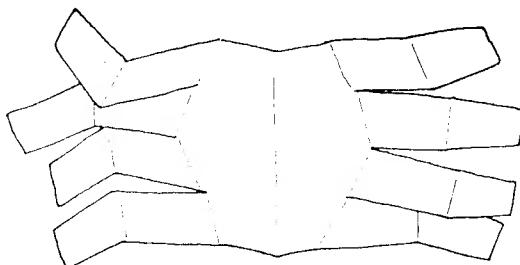
1. Take a 5 x 12 cm rectangle of thick paper. Fold the two short edges and make a firm crease.



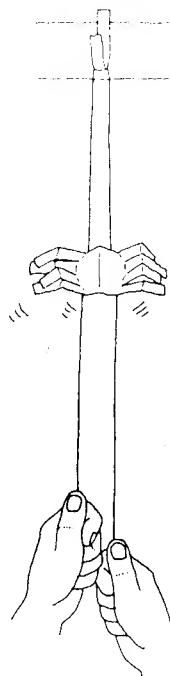
2. With the folded edge at the top, cut several slits through both the layers at the bottom. Then open the paper.



3. Now make the cut ends look like a spider's legs by folding them forwards and backwards....



4. ... like this. You can shape the legs and paint the eyes of the spider.

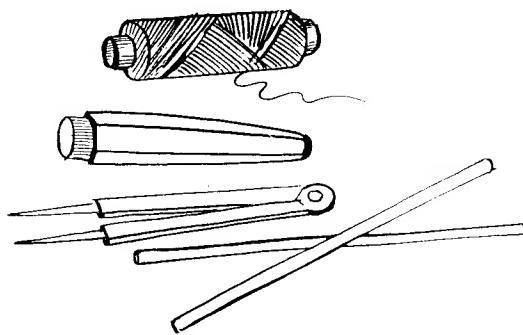


5. Glue the spider to the mechanism of the matchbox racehorse. Loop the string over a nail. Pull the left and right strings in succession to make the spider climb. You could similarly stick a paper rocket and make it go to the moon.

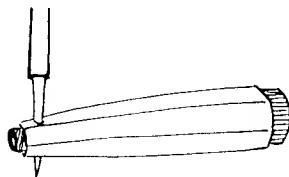
Shimmering Fish

This toy is based on a traditional folktoy, which is very popular in Bengal. In this toy as soon as you pull the sticks apart and tighten the thread, a fish comes shimmering down !

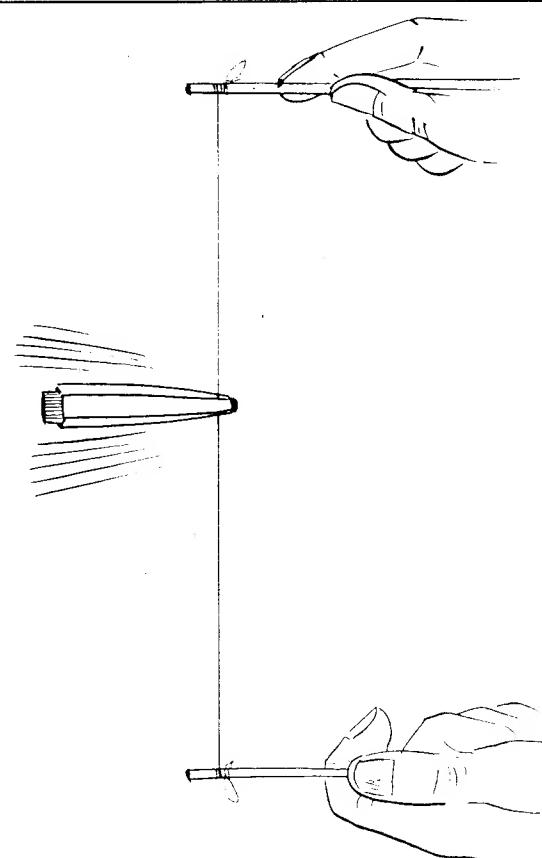
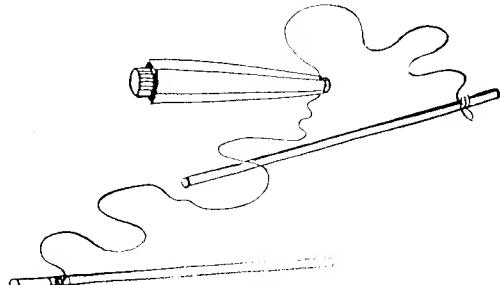
1. For making this toy you will need the plastic cap of an old sketch pen, a divider, sewing thread, two thick broomsticks from a *phooljhadu*, and a piece of chalk or wax crayon.



2. With the help of a divider point make a hole near the closed end of the sketch pen cap.

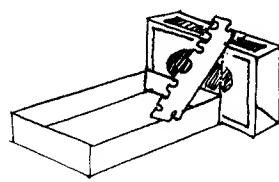


3. Weave a 50 cm sewing thread through this hole and tie the ends of the threads to two broomsticks.

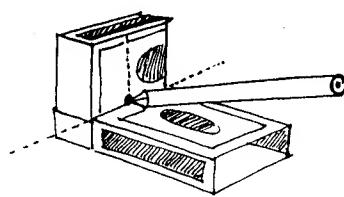


4. Now separate the sticks apart to make the thread taut. You will see the cap falling in jerks in a very intriguing motion. It appears to come down the thread like a shimmering fish. If the hole has become too big then weigh down the cap by press fitting a piece of chalk or a wax crayon.

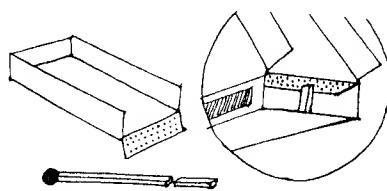
Matchbox Tipper



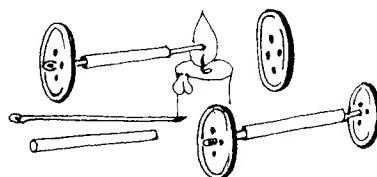
1. Take an empty matchbox . Remove its drawer. Cut the outer shell to fit in the drawer. This becomes the driver's cabin.



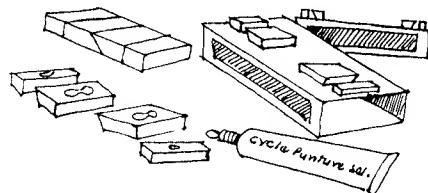
2. Make a hole in the cabin and insert the drawer in a second shell. This is the truck's body.



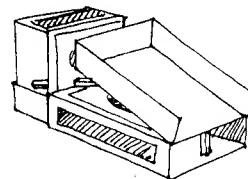
3. Take another drawer. Fold its tongue and wedge it in the truck body with a piece of matchstick, or stick it with glue.



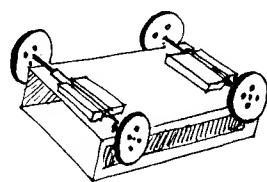
4. Use cheap plastic show - buttons for wheels, needles for axles and used ballpen refill pieces as bearings. Make two pairs of wheels.



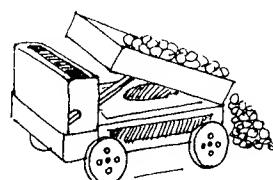
5. Cut a rubber into 4 pieces. Stick them in pairs below the body with Fevibond. The gap between one pair should be equal to the thickness of the refill.



6. Insert a matchstick lever in the hole of the driver's cabin.



7. Fix the wheels to the body of the tipper.

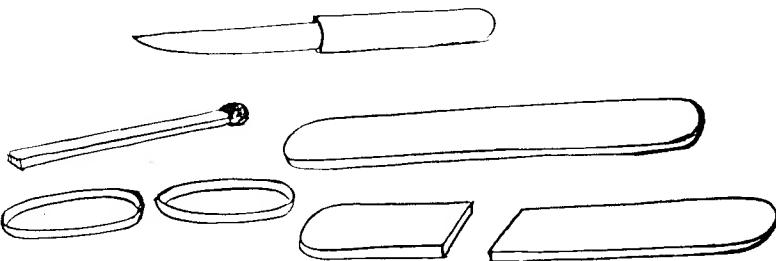


8. Load small pebbles in the truck. On pressing the matchstick lever the loading platform will be raised and the cargo will be unloaded. Push the tipper to make it run.

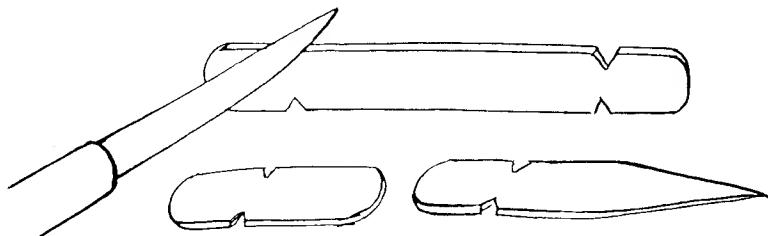
Flick Knife

This is an excellent example of an indigenous folktoy. This automatic mechanical knife - a *Rampuri Chaku*, is fun to make and a sheer delight to play with.

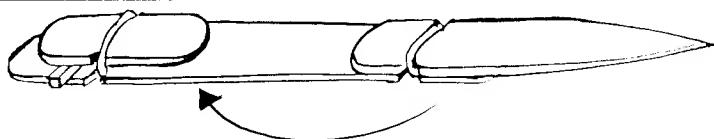
1. To make the Flick Knife you will need two wooden ice - cream sticks, two small rubber bands, a matchstick and a knife or a sharp blade. Cut one ice - cream stick about 3 cm from one end.



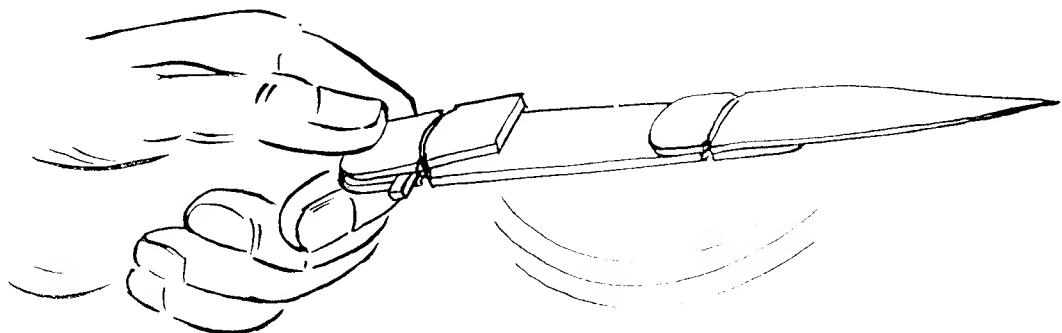
2. Make notches in the cut pieces as shown. Also cut a taper in the long piece so as to look like a knife blade. Make notches on the other ice - cream stick too, as shown.



3. Join the cut pieces on the big ice - cream stick by putting a rubber band in each pair of notches. Slip in a small piece of matchstick between the small piece and the big ice - cream stick. This is the fulcrum and is part of the locking system. By pressing it you can open and close the lock.



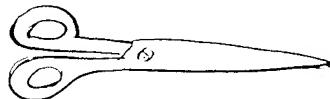
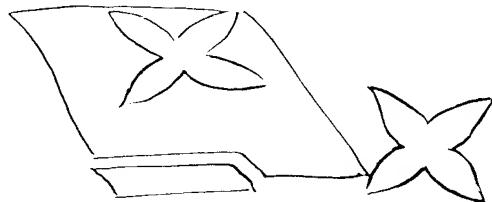
4. Now swing the blade and lock it under the small piece.



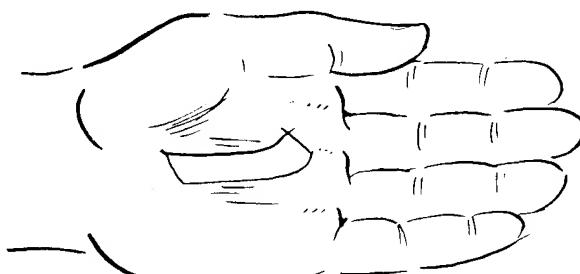
5. Now, if you press the left button, the blade will flick open in a fraction of a second.

Paper Alive !

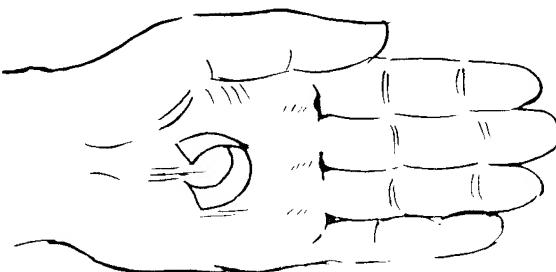
As soon as you cut a small strip of this paper and place it on your hand, it begins to twist and turn as if it were alive.



1. You need some cellophane paper - this is the kind of transparent strong paper which is used for packing sweet boxes. You can even try using the transparent outer wrapping of a cigarette packet. With a scissors cut a 1 cm wide and 4 cm wide strip, and a flower with four petals from this cellophane paper - which is also called as gelatin paper.



2. Keep the strip on your hand.



3. Soon the strip will begin to curl up. It will twist and turn as if the paper had life in it !

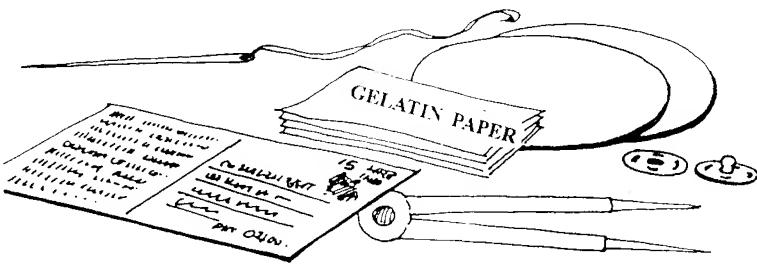


4. The four petals of the flower will curl and fold into a bud shape. Why does this happen ? Does this happen because your palm is moist, or warm ? Will the flower curl up if instead of your palm you rested it on a moist handkerchief or a stainless steel plate in the sun ?

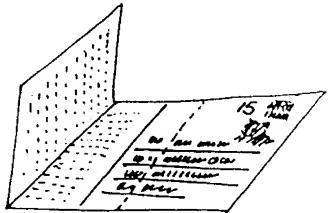
Colour Mixers

These toys are an extension of the red goggles sold in village fairs. In these toys you can see the three primary colours, and also mix them to create more colours.

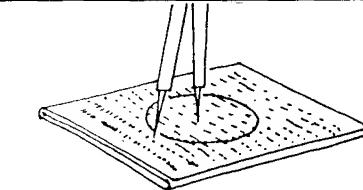
1. To make the colour mixer you will require an old postcard, cardsheet, a press button, needle, thread, a divider, scissors, glue and different colours of gelatin paper (blue, red and yellow are essential).



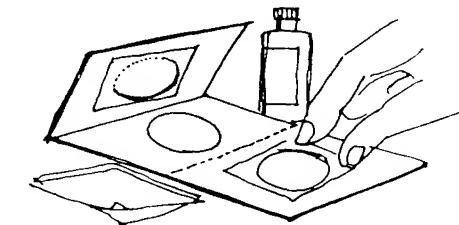
2. Fold an old postcard into three equal parts.



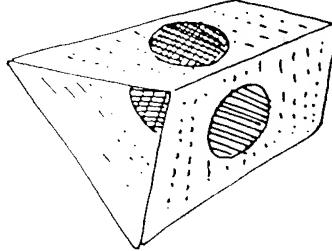
3. With the help of a divider cut three overlapping windows on the postcard.



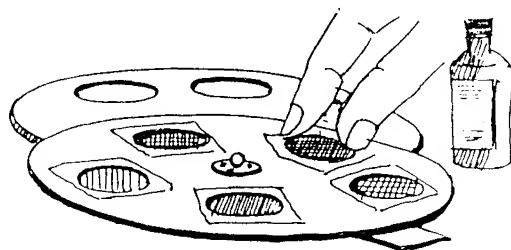
4. Stick three different colours of gelatin papers on the windows. Blue in the middle and red and yellow on the sides. View through these windows one at a time.



5. Then fold the red window on the blue one. Do you see purple ? Fold the yellow window on the blue. Do you see green now ?



6. Cut two 10 cm discs from a cardsheet. Cut five circular windows in each disc with a divider. Stitch one half of a press - button in the centre of each disc.



7. Stick different colours of gelatin papers on the windows. Now assemble the discs by snapping the press - buttons. Rotate one disc while keeping the other stationary to see a motley rainbow of colours on your **Colour Wheel**.